Title	**Demonstrate basic knowledge of diagnostics and fault finding of telecommunications installations**		
Level	**3**	**Credits**	**5**

Purpose	This unit standard is intended for technicians who require basic knowledge of telecommunication networks. People credited with this unit standard are able to: – demonstrate knowledge of basic techniques to identify the location and cause of faults in telecommunications equipment; – demonstrate knowledge of the use of basic diagnostic equipment used for fault finding common telecommunications equipment; and – demonstrate basic knowledge of maintenance and calibration requirements for fault finding, test, and diagnostic tools and equipment used in telecommunications practice.

Classification	Telecommunications > Telecommunications – Service Delivery

Available grade	Achieved

Guidance Information

1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with relevant industry and legislative requirements. Assessment can take place in access network telecommunication work environments. Service manuals should be available during assessment.

2 Legislation and references relevant to this unit standard include:
- Electricity Act 1992;
- Health and Safety at Work Act 2015;
- Privacy Act 2020;
- Resource Management Act 1991;
- Telecommunications Act 2001;
- New Zealand Telecommunications Forum Inc., *Customer Complaints Code;* available from https://www.tcf.org.nz/industry/resources/publications/industry–standards–guides/;
- and all subsequent amendments and replacements.

3 Definitions
Basic knowledge refers to fundamental operational and theoretical knowledge of the subject matter to interpret available information.

Industry requirements refer to relevant policies, processes, methodologies, industry codes of practice, site specific health and safety plans, standard operating procedures, quality plans, work plans, traffic management plans, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer's requirements, contract specifications, manuals, and procedural documents.
Systematic testing refers to a fault diagnostic process in which each part of the system is tested from one end to the other.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of basic techniques to identify the location and cause of faults in telecommunications equipment.

Performance criteria

1.1 Explain techniques used to diagnose faults in telecommunications equipment in terms of how they would assist you to identify the fault.

Range techniques – observation, simulation, measurement, identification of function loss, comparison, and previous fault data including frequency of occurrence, manufacturers' documentation and diagnostic data, built–in diagnostics, alarm priority.

1.2 Explain common techniques used to isolate a faulty component in a system.

Range systematic testing, half split, loop back, transposition.

1.3 Identify possible external causes of a given fault.

Range may include but is not limited to − mechanical versus electrical, control circuit versus power circuit, environmental influences, module versus wiring and terminations, where appropriate alternatives listed in service diagnostics book or service manual; evidence of two external causes is required.

1.4 Explain the requirement to prevent diagnostics affecting the operation of working systems.

Range working systems – standby paths, power supplies, interference, impedance mismatch, use of monitoring points.

Outcome 2

Demonstrate knowledge of the use of basic diagnostic equipment used for fault finding common telecommunications equipment.

Performance criteria

2.1 Identify built in test equipment available for an item of equipment.

Range local craft terminal, built in test equipment, built in diagnostic tools, logs.

2.2 Explain basic testing tools for a simple Local Area Network (LAN) in terms of features offered.

Range Light Emitting Diode (LED) Indicators, wire mapping, laptop, ping, packet trace tools.

2.3 Explain four basic testing tools in terms of features offered for a simple installation.

2.4 Explain storage, transport, and handling of basic diagnostic equipment in accordance with industry practice.

Range Electrostatic Discharge (ESD) damage, physical damage, moisture damage, packaging, labelling, securing in vehicle, temperature control, shock damage.

Outcome 3

Demonstrate basic knowledge of maintenance and calibration requirements for fault finding, test, and diagnostic tools and equipment used in telecommunications practice.

Performance criteria

3.1 State reasons calibration and maintenance schedules for test and diagnostic tools and equipment is important.

Range evidence of a minimum of five reasons is required.

3.2 Explain self–validation methods used for test and diagnostic tools and instrumentation in accordance with industry practice for installations.

Range evidence of a minimum of six methods is required.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 July 2013	N/A
Rollover and Revision	2	23 November 2017	N/A
Revision	3	28 October 2021	N/A

Consent and Moderation Requirements (CMR) reference	0101

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Connexis – Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.